

REMARKS

The Office Action mailed on August 19, 2005, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 1-9 were pending. By this paper, Applicant does not cancel any claims and adds claims 10-11. Therefore, claims 1-11 are now pending.

Applicant respectfully submits that the present application is in condition for allowance for at least the reasons that follow.

Indication of Allowable Subject Matter

Applicant thanks Examiner Lum-Vannucci for the indication that claims 2-6 contain allowable subject matter.

Rejections Under 35 U.S.C. § 102

Claims 8 and 9 stand rejected under 35 U.S.C. §102(b) as being anticipated by Kaufmann (United States Patent No. 6,370,460). In response, Applicants traverse the rejection of these claims, and respectfully submit that these claims are allowable for at least the reasons that follow.

Applicants rely on MPEP § 2131, entitled “Anticipation – Application of 35 U.S.C. 102(a), (b), and (e),” which states that a “claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” It is respectfully submitted that Kaufmann does not describe each and every element of either of claims 8 and 9.

Claim 8 recites a steering process comprising “examining a *difference between left and right driving forces individually controlled* for the left and right drive wheels,” and varying a “steering assistance force so as to compensate a steering reaction force acting on [a]

steering input device in accordance with the ***difference between the left and right driving forces.***" (Emphasis added.) In an exemplary embodiment of a device implementing the invention of claim 8, shown in Fig. 1, the left and right steered wheels are attached to separate individual drive motors 17 and 18, respectively. These drive motors impart respective driving forces on their respective wheels, the driving forces being individually controlled. That is, during some drive conditions, the driving force of the left wheel may be controlled to be different than the driving force of the right wheel.

Kaufmann does not teach, either explicitly or implicitly, "examining a difference between left and right driving forces individually controlled for the left and right drive wheels." Indeed, it cannot teach such a process step, for Kaufmann does not teach the use of a device for individually controlling driving forces of the wheels. The Office Action asserts that the road wheel unit 16 controls individual left and right driving forces on the wheels. This is not so. Road wheel unit 16 is merely a device used for steering a vehicle. (See, e.g., (i) Abstract: "road wheel command signals are sent to road wheel units *to provide steering direction*"; (ii) col. 3, lines 59-63: "there may also be a desire *to command each road wheel unit 16 with a different command* as required to obtain desired performance. For example, the commands may differ when cornering a vehicle to enhance individual road *wheel tracking of the desired radius*"; (iii) col. 7, lines 46-47 "a road wheel unit responsive to a road wheel command signal *for steering a vehicle*"; Fig. 1; etc. (Emphasis added.)) Thus, Kaufmann does not and cannot teach the above process step. Kaufmann does not anticipate claim 8.

Claim 9 recites an apparatus for controlling left and right steerable drive wheels of a vehicle, comprising, a "means for controlling *left and right driving forces of the left and right drive wheels individually*" and "means for calculating a steering reaction force acting on the steering input device in accordance with *a left and right driving force difference between the left and right driving forces.*" (Emphasis added.) As noted above, road wheel unit 16 is merely a device used for steering a vehicle. Thus, Kaufmann does not and cannot anticipate claim 9 as well.

Claim Rejections Under 35 U.S.C. §103(a)

Claim 1 is rejected under 35 U.S.C. §103(a) as being unpatentable over Husain (U.S. Patent No. 6,580,989) in view of Kaufmann (U.S. Patent No. 6,370,460), and claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Husain in view of Kaufmann and Kurishige (U.S. Patent No. 6,736,236). Applicant respectfully traverses the rejection as to the claims above, and submits that these claims are allowable for at least the following reasons.

Applicants rely on MPEP § 2143, which states that:

[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

It is respectfully submitted that at least the first and third criteria of MPEP § 2143 have not been met in the Office Action.

The Cited References Do Not Suggest All Claim Recitations

Even if the first requirement of MPEP § 2143 was satisfied in the Office Action (which it is not, as explained below), the cited references still do not meet the third requirement, which is that “the prior art reference (or references when combined) must teach or suggest all the claim limitations.”

Claim 1: Claim 1 recites a steering apparatus comprising “a driving force control section to control left and right ***driving forces of the left and right drive wheels individually.***” (Emphasis added.) In reference to the discussion above, such a feature, in an exemplary embodiment, permits a driving force on one wheel to be controlled to be different from that on another wheel.

The Office Action asserts that controller 16 is “for controlling the left and right wheels 48” of Husain. This is not the case. Controller 16 of Husain is merely a control device for some of the components of Husain’s steer-by-wire system. Husain specifically states that the “steer-by-wire system 10 includes as its primary components a driver interface system (DIS) 12, a road wheel actuator system (RWAS) 14, and *a controller 16 for monitoring and controlling the respective systems.*” (Husain, col. 3, lines 10-14, emphasis added.) That is, controller 16 is entirely used for steering the wheels of the vehicle. At col. 3, lines 46-49, Husain goes on to state that the “RWAS 14 includes a road wheel actuator 38 responsive to control commands from the controller 16. The road wheel actuator 38 is operatively coupled to a pinion gear 42, which is in turn engaged to a rack gear 40” With controller 16, Husain is clearly teaching a device that is used to steer the wheels of a vehicle and not a device used as a driving force controller for controlling left and right driving forces of the left and right drive wheels individually, as claimed.

For the analogous reasons relating to the deficiencies of Kaufmann with respect to claims 8 and 9 detailed above, Kaufmann does not remedy this deficiency of Husain with respect to claim 1. In sum, claim 1 is not obvious in view of the Husain – Kaufmann combination.

Claim 7: Claim 7, which depends from claim 1, is allowable for at least the same reasons that make claim 1 allowable. Moreover, Kurishige fails to remedy the deficiencies of Husain and Kaufmann with respect to the driving force control section recitation. Specifically, as with Husain and Kaufmann, Kurishige fails to teach or suggest control of left and right driving forces of the left and right drive wheels *individually*, and the Office Action does not proffer anything to the contrary. Thus, claim 7 is not obvious.

In sum, even if the first requirement of MPEP § 2143 is satisfied, the third requirement of MPEP § 2143 is not satisfied in the Office Action, since the cited references do not teach each and every element of the inventions of claim 1 or claim 7. Thus, these claims are allowable.

Lack of Suggestion or Motivation to Modify or Combine the References

MPEP § 2143.01 details the requirements on the PTO for establishing motivation to modify or combine references to reject a claim as obvious. One requirement, as detailed in MPEP § 2143.01, subsection 6, is that “the proposed modification cannot change the principle of operation of a reference – If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959).” In *Ratti*, the CCPA held that the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in the primary reference.” This substantial redesign would have resulted in changing a rigid seal to a resilient seal. Thus, a reference cannot be modified to render an invention obvious if the modification changes a principle of operation of the reference.

With the above in mind, it is respectfully submitted that since the teachings of Husain, according to the Office Action (in citing col. 3, lines 62-65 of Husain) rely on analyzing ***steering forces on the rack*** imparted during a steering operation to monitor performance of Husain’s steering operation, substituting an analysis of a difference between left and right ***driving forces of the wheels*** for the analysis of forces on the rack would change the principle of operation of Husain from one of reliance on steering forces on a rack, to reliance on driving forces on wheels.¹ Since modifying Husain to utilize the alleged features of Kaufmann changes the principle of operation of Husain, just as changing the rigid seal to a resilient seal was found to change the principle of operation in *Ratti*, “the teachings of [Husain] are not sufficient to render the claims *prima facie* obvious.” (MPEP § 2143.01, emphasis added.)

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Further, the Office Action merely proffers alleged results of the propose combination of Husain with Kaufmann. Applicant respectfully submits that a *result* is not the same as a

¹ Again, Applicant notes that Kaufmann does not teach use of a difference between left and right driving forces of wheels.

reason why one of ordinary skill in the art would be motivated to combine the references, however desirable those results may be. If motivation to combine references to establish a *prima facie* case of obviousness could merely be satisfied by a result-oriented analysis of the prior art, the first requirement (and second requirement) of MPEP § 2143 would be completely vitiated. This is because by identifying references that teach each individual element of a claimed invention, implementation of the teachings of the cited references almost always necessarily provides results according to a given invention under examination. Indeed, such an analysis relies on impermissible circular reasoning.

In contrast to the result-oriented analysis proffered in the Office Action, the MPEP specifically states that “the prior art must suggest the desirability of the claimed invention.” The Office Action, in relying only on results, does not identify where the prior art suggests the desirability of a steering apparatus as claimed. Thus, a *prima facie* case of obviousness has not been established.

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In sum, because of the lack of suggestion or motivation in the prior art to modify the reference, the first requirement of MPEP § 2143 has not been met and, hence, a *prima facie* case of obviousness has not been established.

New Claims

As seen above, new claims 10 and 11 have been added. Support for these claims may be found, among other places, at Figs. 1 and 2 of the application as originally filed.

These claims are allowable for at least the reasons that make claims 1 and 9, the claims from which claims 10 and 11 respectively depend, allowable. Moreover, these claims are allowable because none of the cited references disclose or suggest “a left wheel motor to drive the left drive wheel to drive the vehicle, and a right wheel motor to drive the right drive wheel to drive the vehicle,” and because none of the cited references disclose or suggest a “left wheel drive means for driving the left steerable drive wheel to drive the vehicle, and right wheel drive means for driving the right drive wheel to drive the vehicle”

Entry and allowance of these claims is respectfully requested.

Conclusion

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Lum-Vannucci is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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